

JPRS 77837

15 April 1981

# Worldwide Report

TELECOMMUNICATIONS POLICY,  
RESEARCH AND DEVELOPMENT

No. 158



FOREIGN BROADCAST INFORMATION SERVICE

#### NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

#### PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available from Bell & Howell, Old Mansfield Road, Wooster, Ohio 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

15 April 1981

# WORLDWIDE REPORT

## TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

No. 158

### CONTENTS

#### WORLDWIDE AFFAIRS

Indian Minister on Progress of Nonaligned Pool (PATRIOT, 18 Mar 81).....	1
---	---

#### ASIA

##### BANGLADESH

Text of Information Minister's Speech in Bangkok (Shamsul Huda Chowdhury; THE BANGLADESH TIMES, 4 Mar 81).....	2
---	---

Briefs Satellite Station Ordered	6
-------------------------------------	---

##### INDIA

Work Progresses on Satellite Earth Stations (THE HINDU, 13 Mar 81).....	7
--	---

Scientist Tells Plans for Weather Warning System (THE HINDU, 16 Mar 81).....	8
---	---

First Seven-Digit Telephone Exchange Opens (THE TIMES OF INDIA, 13 Mar 81).....	9
--	---

Briefs PTI Computerization Plans	11
PTI Plans S.E. Asia Beam	11
Polar Satellite Plans	11
Satellite Launching	12

## PAKISTAN

### Briefs

Linked With ISD	13
Ship to Shore Service	13

## EAST EUROPE

## YUGOSLAVIA

Telecommunications Via Satellite in Yugoslavia Detailed (Avram Sion; TEHNIKA, No 1, 1981).....	14
---	----

## LATIN AMERICA

## BRAZIL

Figueiredo Approves Domestic Communications Satellite (Jose Roberto de Alencar; GAZETA MERCANTIL, 25 Feb 81).....	25
--	----

### Briefs

Communications Minister Visits Europe	27
Communications Minister on Satellite Cost	27
Technology Transfer Contract Controls	28
Discussions With Venezuela	28

## NEAR EAST AND NORTH AFRICA

## INTER-ARAB AFFAIRS

Maghreb Modernizes Its Communication Systems (8 DAYS, 7 Mar 81).....	29
---	----

## SUB-SAHARAN AFRICA

## INTER-AFRICAN AFFAIRS

Nigeria, Ivory Coast in Undersea Cable Venture (Dapo Ajibola; BUSINESS TIMES, 3 Mar 81).....	31
Submarine Cable Links Various Countries (NEW NIGERIAN, 17 Mar 81).....	32

## KENYA

Briefs	Second Satellite Antenna	33
--------	--------------------------	----

## LIBERIA

Briefs	FM Radio Station	34
--------	------------------	----

## NAMIBIA

Briefs	Solar Microwave Repeater	35
--------	--------------------------	----

## NIGERIA

	Some States Allegedly Got TV Frequencies Illegally (Onafune Amrun; NEW NIGERIAN, 2 Mar 81).....	36
Briefs	Abuja Telephone Exchange Complex	37
	Governor: Permit Short Wave	37

## WEST EUROPE

### DENMARK

	Ministry Report to Folketing Urges State Control Phone Net (BERLINGSKE TIDENDE, 13 Feb 81).....	38
--	--	----

### NORWAY

	Telecommunications Exports Increase, Despite Small Industry Size (Morten Abel; AFTENPOSTEN, 23 Feb 81).....	39
--	--	----

INDIAN MINISTER ON PROGRESS OF NONALIGNED POOL

New Delhi PATRIOT in English 18 Mar 81 p 2

[Text] Nonaligned countries, thus far dependent on western news agencies for information have reached a level of exchanging among them 40,000 words of news each day Minister of Information and Broadcasting Vasant Sathe said in Lok Sabha on Tuesday reports PTI.

Mr Sathe at the same time wished that more of the information from the nonaligned news agencies pool were used.

The extent of such use varied from country to country and in India itself the Government could

not ask newspapers to use more of the pool news. However, in other media like the radio and television 'we are utilizing substantial part of the information' he added.

Mr Sathe said that India was taking every possible step to utilise modern technology to develop communication links with nonaligned countries.

The country's premier news agency PTI was handling the press agencies pool on the Indian side. It was using satellite for exchange of programmes in ar-

rangements with Yugoslavia and other countries, he informed the House. Latest developments including computer technology were being used.

Miss Kumud Joshi said the nature of India's offer of expertise

in the nonaligned pool for a balanced flow of information would depend on what news agencies might seek and what India might be in a position to meet.

The offer was made last month at a meeting in Delhi of the coordinating committee of the non-

aligned pool.

Mr Sathe said the pool, established by the nonaligned countries in 1970, had been working successfully since then, more than 70 countries were today its members.

Decisions at the Delhi meeting covered ways of providing free flow of information among developing countries and programmes of assistance for training journalists from those countries at the Indian Institute of Mass Communication.



TEXT OF INFORMATION MINISTER'S SPEECH IN BANGKOK

Dacca THE BANGLADESH TIMES in English 4 Mar 81 p 5

[Speech by Shamsul Huda Chowdhury, information and broadcasting minister at an international seminar on communication policy for rural development in Bangkok]

[Text] I express my heart-felt thanks to the organisers of this seminar for giving me the opportunity to come all the way from Bangladesh to associate myself with the International Seminar on Communication Policy for Rural Development. I feel honoured to have been asked to deliver the keynote address on the theme of the Seminar. As a life-long humble practitioner in the field of mass communication I feel extremely happy to meet my brothers in the profession from the countries of the Region. Experts and academicians are there to thrash out the thorny problems of communication in rural areas where 80 to 90 per cent of the developing countries population live. Illiteracy and hunger are their baneful companions.

Irony of the fact is that this rural populace is responsible for the production of the major share of the country's wealth and in fact, destiny of the nation rests on them. Diverse in many ways, we in Asia share some common experiences. This is as much true of Bangladesh as it is true of any other country in this part of the globe.

In Bangladesh we have adopted rural development strategy not as a political expediency but as a political movement for the development of the entire nation. In fact, to every Bangladeshi it has become an article of faith. 'Work or perish'--is the only slogan that reverberates throughout the country. Therefore, upon improving the lot of these people depends the development of the country and to an Asian development means development of these rural people.

Now, the chief task for rural development is to bring about an improvement in the quality of life; more specifically to improve the availability of a variety of socio-economic amenities and enhance the scope for human development.

Communication may not be panacea for all the ills. But it can play a definite role in bring about the change through motivation, mobilisation of public support and education. [as published]

Like all other less developed countries Bangladesh is following the strategy for planned development. We have launched the Second Five Year Plan (1980-85) for massive national development. The plan has incorporated a model of comprehensive approach for rural development which seeks to expand welfare and security of the people including family planning, health education, human resource development and sanitation, the ultimate aim of which will be the improvement of the quality of life of the masses.

The recent institution of Gram Sarkar (Village Government), composed of people's representatives, as the grassroot level political and administrative unit for mobilisation of local resources and ensuring greater participation of the people is a landmark in the development of rural Bangladesh. Gram Sarkar is responsible for land use, production plan, employment, planning education, family planning and environmental health as its primary function.

In the productive side people are being organised in groups of Farmers' Cooperatives under the Integrated Rural Development Programme and cooperatives belonging to IRDP are functioning in 250 thanas (lowest administrative unit), out of 465 thana in Bangladesh.

Under Voluntary Mass Participation Programme, 676 miles of canals were dug during the year 1980 alone. These canals are being used for both irrigation and drainage and development of fisheries. This is a unique experience of mass participation in development work.

The leadership comes from Hon'ble President Ziaur Rahman himself. Like a skillful communicator, he enthused and motivated the entire populace especially in the areas where irrigation and drainage is essential into participating in canal digging and road building. People were so much enthused that even the highbrow intellectuals in cities and towns are being impelled to join the operation as if they were performing a sacred duty towards the nation.

An evaluation study of UNESCO Experimental World Literary Programme carried out in different countries seems to establish the fact that a significant proportion of new literates acquires a modern outlook i.e., exposure to mass media, management of personal finances, seeking out technical advice, use of Three R's and participation in formal organisation. Bangladesh has launched Mass Literacy Campaign to remove illiteracy and is going to introduce compulsory free primary education from 1985.

Simultaneously with all other development programmes, Youth Movement has been organised to mobilize youth population in rural areas. In the process they will be trained in agriculture livestock, poultry farming and fisheries including marine fishing.

Communication has a tremendous role to play in the context of development work that is going on in the villages throughout the length and breadth of the country. As I have mentioned earlier, mass contact at political level headed by the President himself has gone a long way in disseminating messages of development in rural areas. Nevertheless, entire mass communication media of the country have been geared up to carry the messages of this gigantic task of development.



In Bangladesh the most extensive as well as effective of all the mass media is radio. At present eleven transmitters with a total capacity of 1268 kilowatts are operating in the medium wave and the rest four transmitters of the total capacity of 225 kilowatts are operating in the short wave. Areawise, it covers the whole territory of Bangladesh. However, the country has at present about three million radio sets. Efforts are being made to supply sets at cheaper rates by increasing the assembling capacity and also through import of one-hand cheap sets from abroad. Radio Bangladesh has 17.5 hours' a day non-stop broadcast from 6.30 morning to 12 midnight. Radio can reach a large audience cheaper and more quickly than any other means of communication.

Bangladesh Television has at present 6 relay stations--all the programmes originating from the main station in Dacca. These stations cover 90 per cent of the country's area. Bangladesh Television has also started second channel. Television sets being costly, the number of sets available with the people is still limited. There are about 100,000 TV sets in the country including about 4,000 community sets. Using a multiplier of 10 and 200 persons per private and community sets respectively, the total number of viewers will be around two millions. The Government has further been distributing free and subsidised TV sets for community viewing to local organisations and it is planned to make one TV set available to each of the 68,000 villages of Bangladesh. Where electricity is not available, we are giving battery-operated sets. Programme-wise TV has a total of 13.5 hours' telecast a day, a considerable portion of programmes being oriented towards social and economic development. The Government is also planning to launch an Educational TV programme to reach the formal educational institutions in a scientific manner.

As for print medium, it moves slowly but steadily. Bangladesh has 44 dailies and 150 weeklies having a combined circulation of a little over a million copies. Because of low rate of literacy in our country it cannot be taken to be an effective medium, but it has a lasting value. The other media that can play an effective role in development are the traditional media and the interpersonal communication. In the field of interpersonal communication extension worker plays a key role. He also assists in productive or programmed activity through training, advice and local trial and demonstration. He is also useful as an intermediary between the productive worker and the public sector agency for arranging supporting services, i.e. credit input and marketing, etc. Many of the Extension Workers and Communicators have been found to be not very clear about their roles. Lack of proper communication skill to handle the entire operation affects communication adversely. Some of the communicators do not listen to the farmer patiently nor do they encourage them to put forth questions and problems to be solved. How to initiate a discussion report messages and influence public opinion, are all important in which most of the extension workers are often found deficient. A communicator devoid of these facts is likely to have little impact on the mind of the rural people Bangladesh has about forty thousand Extension Workers engaged in various development work Training of extension workers in the technique of communication is vitally important and I am happy to note that AMIC has taken up a project for their skill development in Thailand and Bangladesh I wish them success. [as published]

Realizing the importance of the role of inter-personal communication efforts have been made to utilize the country's 5,000 mosques and their Imams for mass education and rural development. Favourable responses are forthcoming from all quarters in this regard. [as published]

Proper emphasis is also being laid on the use of folk media for development purpose [as published]. The folk music and drama such as Jari, Sari, Baul, Bhatailali, Murshidi, Kavigan and Jatragan etc; can be effective communication media for development-oriented programmes and we are making their appropriate use. [as published]

I have narrated the overall communication situation of Bangladesh. Experience has shown that no single medium is suitable for communication with rural people. It has to be a combination of some or all the media available in any country. There is no set formula in this matter. Like all other great human endeavour, it requires sagacity and foresight on the part of the leaders of communication backed by the past experiences if given social conditions to determine how much of what he accepted and adopted. Policy should be such as to produce the maximum effect. We have many problems ahead. Self-sufficiency is one of our great goals and I am confident that our efforts to tackle the communication problems in enhancing rural development can be given a definite direction. [paragraph as published]

CSO: 5500

## BANGLADESH

### BRIEFS

SATELLITE STATION ORDERED--Paris, Mar 11:--Bangladesh has ordered its second earth station for satellite telecommunications from the French economic group Telspace it was learned here Tuesday reports AFP. Telspace has business tieups with Cit Alcatel and Thomoson CSF. The object of the station is to step up international telephonic links and to transmit television broadcast. Thomoson CSF said that it was due be composed within six month. Situated at Talibabad about 60 KM (about 36 miles) from Dacca the station will liaise with an Intelsat Satellite above the Indian Ocean. [Text] [Dacca THE BANGLADESH OBSERVER in English 12 Mar 81 p 1]

CSO: 5500

## WORK PROGRESSES ON SATELLITE EARTH STATIONS

Madras THE HINDU in English 13 Mar 81 p 16

[Text]

From Our Special  
Correspondent

NEW DELHI March 11

Four of the 31 earth stations being set up all over the country by the Posts and Telegraphs Department for the Indian National Satellite (INSAT) to serve domestic telecommunications will be entirely imported.

The remaining 27 stations will have a large indigenous content. The INSAT system is expected to become operational in early 1982.

The total cost of the 31 stations which will form the ground segment of the telecommunications network is estimated at around Rs 6318 crores, which is being shared by P and T and the Telecommunications Research Centre (TRC) of the Union Ministry of Communications.

The earth stations were designed by the P and T and it decided on the technology to be adopted after TRC had participated in the Satellite Telecommunications Experiment Project

jointly carried out by TRC and the Space Application Centre, Ahmedabad, using the Franco-German Symphonie satellite.

## Electronic Exchange

By April this year, the last phase of the field trial of a 1000-line laboratory model of the electronic exchange at Rajoun Gardens, Delhi, (codenamed stored programme control-1) designed jointly by TRC and the ITI will be completed and the evaluation of the exchange's working will commence.

During this phase, which commenced in January facilities like detailed billing of subscriber trunk dialling, abbreviated dialling and hot line have been extended to the existing 300 subscribers served by the present exchange.

The electronic exchange had put on trial early last year about 100 P and T departmental service connections. The feedback from the live traffic trials was used to correct and modify the system both in the electronic circuits

and programmes. In the middle of last year the exchange was tried on public subscribers. The feedback received up to the end of 1980 has helped further refine the system.

The Rajoun Garden exchange is an entirely indigenous effort and the processors for the exchange have been fabricated by Bharat Electronics and the other software developed by TRC.

The R and D programme for the exchange has built up a nucleus of engineering personnel well versed in various aspects of the advanced technology.

CSO: 5500

## SCIENTIST TELLS PLANS FOR WEATHER WARNING SYSTEM

Madras THE HINDU in English 16 Mar 81 p 9

[Text]

## From Our Staff Reporter

VIRAKHAPATNAM, March 15

Three Digital Video Integrator Processors (DVIPSI) will be set up at Madras, Walter and Calcutta in six months to forewarn about storms. Dr P. K. Das, Director General of Meteorology said here on Sunday.

By June next a radar at a cost of Rs 40 lakhs would be commissioned at Machilipatnam and it could cover an area of 400 km. Towards the end of the Sixth Plan period the radar at Dolphin's Nose at Walter would be replaced, he said.

Dr Das said, a UNDP project was being taken up to study river levels after heavy rains. For this purpose the Yamuna catchment area had been selected and a radar would be installed in Delhi. Mathematical models to predict storm-surge along the east coast were being worked out in Delhi and Poona.

By next season, the weather department would be able to predict the wind strength and the location of the eye of a storm, he said.

By 1982 when an Indian Satellite goes into orbit, it would be possible to provide information much quicker through 20 substations to be set up in the country. Out of 110 data collection platforms proposed to be set up by 1985, at a cost of Rs. 14 crores 10

would come up by the time INSAT was launched, he said.

Dr Das said it had been proposed to install black boxes either by the end of 1982 or early 1983 along the east coast which was prone to cyclones. These boxes would be installed wherever there was a cluster of villages. When the box was activated a siren would blare out.

Dr Das said an international symposium under the auspices of the World Meteorological Organisation would be held in Delhi in December 1981 on prediction of drought. It would have great significance for States like Andhra Pradesh which had drought prone areas in Rayachoti and Telangana. The Auto Regressive Integrated Moving Average (ARIMA) technique would enable forecast of rainfall a month in advance, he said.

## Model to Measure Storm-Surge

Our New Delhi Special Correspondent reports.

Radar surveillance of tropical cyclones from coastal stations has recorded a great improvement during the last few years, according to the Indian Meteorological Department.

The mathematical model, being built up by the IMD is based on the techniques it has developed for predicting the rise in sea-level whenever a tropical

cyclone hits a sector of the eastern coast of India.

A rainfall forecast service for periods of one month in advance was introduced for the 1980 monsoon. The results are reported to have shown 80 to 85 per cent success in the forecasts.

Weather modification experiments have also been conducted to increase rainfall over limited areas with encouraging results. Information on cloud structure and movement transmitted by Polar orbiting satellites launched by the U.S. and the Soviet Union is also intercepted at eight stations in India.

## FIRST SEVEN-DIGIT TELEPHONE EXCHANGE OPENS

Bombay THE TIMES OF INDIA in English 13 Mar 81 p 4

[Text] Bombay, March 12. The Union minister for communications, Mr C. M. Stephen, who was scheduled to inaugurate the country's first seven-digit telephone exchange at Prabhadevi today, could not come to the city because of slight indisposition.

The inability to make a physical presence was made good by a telephone call from the minister to the general manager of Bombay Telephones, Mr P. C. Jauhari.

Mr Stephen telephonically dedicated the exchange to the citizens of Bombay and communicated to Mr Jauhari his good wishes to the people of this city.

The entry into the seven-digit telephone culture marks a significant milestone in the country's telecommunication technology.

While a six-digit exchange can help only 700,000 connections to be established, a seven digit one can help establish seven million connections.

The Rs 12.49-crore Prabhadevi telephone exchange houses an automatic telephone equipment supplied by Hitachi of Tokyo.

The installation has been completed in 18 months with the planning and execution carried out entirely by the engineers of Bombay Telephones.

Most of the new exchanges are to be on a seven-digit scheme. Conversion of the existing six-digit numbers into seven-digit ones are to be started from 1983-84 and completed in a phased manner.

While the Bombay Telephones has an equipped capacity of 324,000, the system will double itself over the next four years.

The present exchange at Prabhadevi will also be developed into a major national telecommunication complex. Already, an 18-floor administrative building is coming up and will be completed during the next financial year. The headquarters of Bombay Telephones will then be shifted to that building from the present Colaba Telephone Bhavan site.



In addition to the new 10,000 lines commissioned today, another local crossbar exchange has been planned.

A new manual trunk exchange, in addition to the one existing at South Bombay, will be installed to improve the trunk services, particularly for incoming calls.

An electronic telex of 3,700 lines, imported from West Germany at a cost of Rs 4.2 crores, will also be installed at the Prabhadevi exchange. It will relieve congestion in the existing telex by re-routing the traffic of the other metropolitan cities and district centres. Incidentally, it will also provide a better service for the telex subscribers in Bombay for outgoing calls as the present congestion will be reduced.

An electronic trunk automatic exchange of 5,000 lines, imported from Japan at a cost of Rs 9.49 crores, is also being set up at the Prabhadevi exchange building. It will provide relief to Bombay STD callers. The first 10,000-line electronic exchange with stored programme control is planned for commission by 1983-84.

CSO: 5500

## BRIEFS

**PTI COMPUTERIZATION PLANS**--New Delhi, February 18 (PTI)--The PRESS TRUST OF INDIA plans to computerise its news service operations in major centres in the country by December. The plans were disclosed at a reception yesterday in honour of media representatives from 30 countries attending the coordinating committee meeting of the non-aligned news agencies pool here. Mr C.P.N. Singh, Union minister of state for electronics and science and technology, commended PTI's effort in collaboration with the Computer Maintenance Corporation in the public sector in producing a system that promises cost-effective communication linkages. PTI and the CMC have undertaken a joint study of what computers can offer to wire services. They have set up a computer in PTI's Bombay office. Media representatives from India and abroad saw the presentation of a computerised message-switching system by which news stories, telegrams, aviation messages and weather reports could be sent across the country in minutes. [Text] [Bombay THE TIMES OF INDIA in English 19 Feb 81 p 15]

**PTI PLANS S.E. ASIA BEAM**--New Delhi, February 19 (PTI)--The government has initiated arrangements with the PRESS TRUST OF INDIA for conveying the daily external publicity transmission through PTI's satellite communication channels, particularly to South-East Asia and West Asia, the Lok Sabha was informed today. The law minister, Mr Shiv Shankar, in a written answer on behalf of the external affairs minister, said action in this regard was likely to be completed by the middle of the 1981-82 financial year. "This will improve both the speed and clarity of the transmission of news on Indian developments to our missions abroad in these regions," Mr Shiv Shankar explained. The minister also said the external publicity division had subsidised the location of Indian correspondents belonging to news agencies--PTI, UNI, HINDUSTAN SAMACHRA and SAMACHAR BHARATI--in different countries last year. This had been done for projecting news regarding India "in a positive light through the independent channel of Indian news agencies." The contacts that these agencies would establish with foreign news agencies and newspaper organisations would also be utilised for external publicity purposes. [Text] [Bombay THE TIMES OF INDIA in English 20 Feb 81 p 12]

**POLAR SATELLITE PLANS**--India's ambitious Polar Satellite Launch Vehicle (PSLV) is expected to be launched in 1986-87, reports UNI. [as published] The project envisages development of launch vehicle to place an Indian remote-sensing satellite

of 500-600 kg class in Polar sun-synchronous orbit from an Indian range. This will consist of solid and liquid stages and the upper stages will be derived from the satellite launch vehicle SLV-3, according to the Department of Space. When the launch vehicle is made operational in 1986-87, it would help cater to most of the remote-sensing applications in the country. The project planning and study group has prepared a project report for necessary approval. Under the Satellite Launch Vehicle (SLV-3) project, two developmental and operational flights are planned in 1981 and two operational flights in 1982. The sanctioned cost of the project is Rs 20.49 crores. The total anticipated outlay on the project is Rs 10 crores and this is scheduled for completion in 1982-83, according to the Central budget. [Text] [New Delhi PATRIOT in English 9 Mar 81 p 8]

SATELLITE LAUNCHING--Kolhapur, March 14--India will launch another space satellite in May, according to Dr Vasantrao Gowarikar, director of the Vikram Sarabhai Space Research Centre. Dr Gowarikar, who was on a visit to his native town, Kolhapur, told newsmen yesterday that the successful launching of the SLV rocket was a step in this direction. In 1969, India launched a small satellite of seven kgs but after 12 years it did one weighing 17,000 kgs. He spoke of the progress of India's space development programme and said that the first satellite was rocketed with no control, but the second was a four-stage remotely controlled one. The SLV rocket had 100,000 small components and wires of a total length of 25 km. He maintained that though India was the sixth country launching space satellites, it would not join the big power competition to conquer space. It would, instead, use its knowledge in developing satellite television techniques which would be of great help for its industrial and agricultural developments. Earlier, Dr Gowarikar, as chief guest at the valedictory function of the century celebrations of the Rajaram college here, of which he was a student, said he owed many things to the college. [Text] [Bombay THE TIMES OF INDIA in English 15 Mar 81 p 6]

CSO: 5500

## BRIEFS

**LINKED WITH ISD**--Karachi, March 13--Pakistan was linked directly with 4 more countries through the international subscribers dialling service (ISD) the Pakistan Telephone and Telegraph Department said here yesterday. The 4 countries which now could be dialled directly on ISD Service are Singapore (65), Bahrain (1973) Oman (968) and Japan (81). This brings the total destinations on ISD to 13. 9 other countries which could directly be dialled by subscribers are Saudi Arabia (960), Kuwait (965), Switzerland (41), Iran (98), West Germany (49), UAE (971), France (33), Italy (39), and Ireland (353). According to the International Gateway Exchange sources in Karachi negotiations are also in progress for having some countries directly linked with Pakistan through ISD these include Britain and United States of American. [as published] APP [Text] [Quetta BALUCHISTAN TIMES in English 14 Mar 81 p 4]

**SHIP TO SHORE SERVICE**--A ship to shore radio-telephone communication service has been introduced by the Overseas Telecommunication Department, it was officially learnt in Karachi. Operating on high frequency transmitters the service will facilitate the people to book calls from ship to any place in Pakistan and vice-versa. The service is in addition to the existing VHF R/T service operating within a distance of 200 miles. Under the new arrangements merchant ships were now contactable from Suez Mediterranean in the West to Singapore, Hong Kong in the East under normal radio propagation conditions. According to officials of the overseas telecommunication region, trial test for NMF R/T ship to shore communication services were carried for quite sometime before its final commissioning. The equipments for the service have been installed at the international gateway exchange. People have been advised to avail of the facility by booking calls to ships at 102 and enquiries at 104 as usual.--APP [Text] [Karachi BUSINESS RECORDER in English 16 Mar 81 p 3]

CSO: 5500

UDC 621.391:621.396.946(497.1)-861

## TELECOMMUNICATIONS VIA SATELLITE IN YUGOSLAVIA DETAILED

Belgrade TEHNIKA in Serbo-Croatian No 1, 1981 pp 121-125

[Article by Avram Sion, graduate engineer, Development Sector of the Belgrade PTT Enterprise; submitted 15 Sep 80]

[Text] Avram Sion was born in 1946 in Skoplje. He graduated from the School of Electrical Engineering of Belgrade University in 1970. He is employed as the chief engineer for development of satellite communications in the Development Sector of the Belgrade PTT Enterprise. He worked on the planning, design and actual construction of the "Yugoslavia 1" ground station near Ivanjica. He is now working on planning construction of the "Yugoslavia 2" ground station and a ground station for the ECS [European Communication Satellite] system. He is the author of a sizable number of technical articles and papers and of several contributions for CCIR [International Consultative Radio Committee of International Telecommunications Union]. He has been an active participant in the work of Study Group 4 (stationary satellite communications) of the Yugoslav National Committee for the CCIR. He has participated in the work which CCIR Study Group 4 has done on the CCIR SPM [expansion unknown] for the WARC-79 [expansion unknown] and on the WARC-79 itself.

## 1. Introduction

Arthur C. Clarke published the first idea of using satellites stationary relative to the earth in telecommunications back in 1945 [1]. Taking up Clarke's idea and looking to the potential which satellite communications embody, in 1964--7 years before the first artificial earth satellite was launched--14 countries created the International Organization for Telecommunications via Satellite, Intelsat. The best confirmation of how worthwhile this idea is, of the success of its realization and of its general acceptance lies in the fact that today there are more than 100 member countries in Intelsat. This system covers the entire world and more than 200 ground stations are operating within it. In addition to this system, there are a number of national satellite telecommunications systems.



The commercial use of satellites in telecommunications began back in 1965, the year after formation of Intelsat, when the Early Bird satellite was launched.

Yugoslavia's entry into Intelsat in 1970 was the first step toward application of satellite telecommunications in Yugoslavia. In 1972, immediately before commencement of construction of the "Yugoslavia 1" ground station, the first satellite telephone channels were leased on the intercontinental routes for the United States and Canada via the ground station of a neighboring country. Two years later, in 1974, the "Yugoslavia 1" ground station was put into operation.

The "Yugoslavia 1" ground station began operation in the Atlantic region of the Intelsat system with a total of eight telephone channels for the two direct routes we have mentioned. Today telephone and telegraph communications are handled through this station on more than 20 direct routes, with a total of 60 telephone channels. Television transmissions are handled with various countries of this region as necessary.

## 2. The Intelsat System

Since the time of Early Bird (INTELSAT I), a satellite with a capacity of 240 television channels which could be simultaneously used by two ground stations, Intelsat quickly has grown into a world system covering the entire world.

In order to cover the entire world the system is organized into three regions: the region of the Atlantic Ocean, the region of the Indian Ocean and the region of the Pacific Ocean. In the Atlantic region, where the needs for satellite channels are greatest, there are three active satellites. Traffic between practically all countries operating in the Atlantic region is handled through the primary satellite. The countries with the greatest needs, which each have two or three antennas in the Atlantic region, handle a portion of their mutual traffic via the other two satellites for what is called the main traffic (MP1 and MP2). In this way all the needs in the region have been met, and the heaviest traffic routes have been diversified. One active satellite is used in each of the other two regions. The regions are indicated in Figure 1.

### 2.1. Development of the Intelsat System

The success of the Early Bird (INTELSAT I) stimulated the rapid development of the system. The constant and very rapid growth of the need for satellite telephone channels and intercontinental TV transmissions have been met by new generations of satellites with ever larger capacity, and this has been achieved through various technical and technological innovations.

INTELSAT I was soon replaced by the generation of INTELSAT II satellites with the same capacity, which made it possible for more than two ground stations to operate simultaneously via the same satellite (multiple access) on the basis of frequency division of FM carriers (FDM/FM/SDMA), which is in effect even today.

The global system, which is organized into three oceanic regions, was created with the generation of INTELSAT III satellites. The capacity of these satellites, which



is 2,400 telephone or 2 TV channels, was achieved by using a frequency band about 500 MHz wide divided between 2 transponders, and a directional antenna embracing only Earth, thus avoiding loss of RF energy into space.

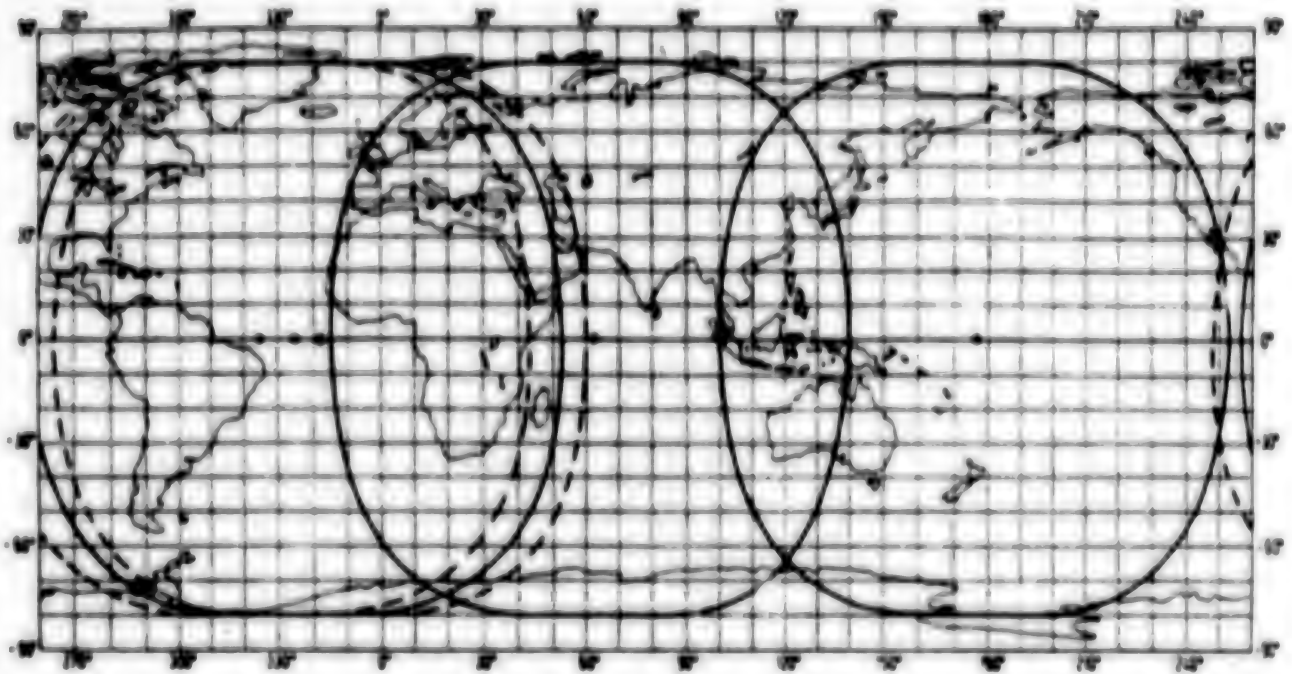


Figure 1. Ocean regions of the Intelsat system.

Satellites of the fourth generation, INTELSAT IV, brought a capacity of about 8,000 telephone and 2 TV channels. This capacity was realized in a frequency band 500 MHz wide divided among 12 transponders with a bandwidth of 36 MHz, which represented the optimum from the standpoint of bandwidth use and limitation of intermodulation. Along with the global antennas covering the entire visible disk of the earth, directional antennas are also used for spot coverage [2]. Use of the SPADE\* system began with these satellites, and for the first time two operational satellites were introduced in the region of the Atlantic Ocean: the primary satellite (P) and the main satellite (MPL).

Satellites of the INTELSAT IV-A generation, which have a capacity of 12,000 telephone and 2 TV channels, are now being used in the system. Dual use of frequency have been put into effect for the first time on the basis of spatial isolation of the directed beams emitted by the antennas on the satellite. This facilitated effective use of more than 800 MHz with an available bandwidth of 500 MHz. In addition, the beams emitted by the satellite antennas are so shaped as to cover only the continents, and the RF energy is not lost to the ocean areas [3, 4]. In the region of the Atlantic Ocean a third operational satellite MP2 has also been introduced. Figure 2 shows the coverage of INTELSAT IV-A satellites in the Atlantic region. In all the Intelsat satellites so far frequencies of about 6 GHz have been used for upward communications and about 4 GHz for downward communications.

\* SPADE--Single Channel per PCM Carrier Multiple Access Demand Assignment Equipment.



Figure 2.

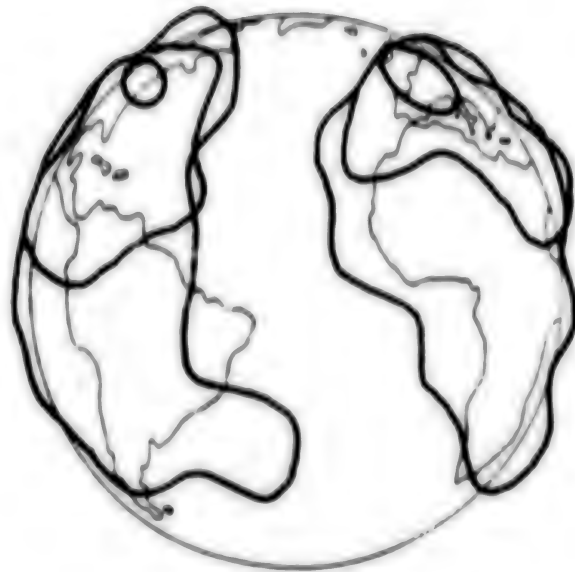


Figure 3.

Figures 2 and 3. Coverage of the INTELSAT IV-A and INTELSAT V satellites in the region of the Atlantic Ocean. H--hemispheric coverage, 6/4 GHz; 2--zonal coverage, E/4 GHz; S--spot coverage, 14/11 GHz; G--global coverage.

The Intelsat system is now on the verge of launching the INTELSAT V generation of satellites. Each of these satellites will have a capacity of about 25,000 telephone and 2 TV channels. The enlargement of capacity will be achieved by fourfold use of the bandwidth about 6/4 GHz and use of a new bandwidth 14/11 GHz. Fourfold use of the frequencies will be achieved through spatial isolation of the directed beams emitted by the antennas (double) and use of orthogonal polarization (double). In this way an effective bandwidth of about 2,000 MHz is achieved from the 500 MHz installed in the system. The coverage of the INTELSAT V satellites in the Atlantic regions is shown in Figure 3.

### 3. Yugoslavia's Participation in Intelsat

Before construction of the "Yugoslavia 1" ground station Yugoslavia's intercontinental communications were accomplished either by shortwave, which was of unsatisfactory quality and inadequate capacity, or indirectly through other countries, which was becoming expensive as needs increased. Building and putting into operation the "Yugoslavia 1" ground station made it possible to establish direct and good-quality telephone-telegraph and TV communications with many countries in the Atlantic region.

#### 3.1. The "Yugoslavia 1" Ground Station

The "Yugoslavia 1" ground station, located near Ivanjica, has been in operation since 1974 in the Atlantic Ocean region of the Intelsat system. Permanently allocated channels are used on five direct routes. Direct communications are accomplished on another 15 routes on request, automatically, when a telephone call is made.

The permanently allocated channels are realized by transmission and reception of FM carriers modulated by a multiplex signal on the basis of frequency division of the channels. Access to the satellite is based on the principle of frequency division. This system (FDM/SM/FDMA) is used on routes with rather heavy traffic which justify constant employment of the channels.

Channels are allocated on request in the SPADE system, which is controlled by computers in SPADE terminals located in various ground stations. The SPADE system consists basically of a decentralized international transit telephone office. When a telephone call comes into any of the 49 SPADE terminals, the computer chooses a free pair among the 800 frequencies and, over a common signal channel, it so informs the SPADE terminal to which the call is being made. On the basis of that information the other SPADE terminals bring their own frequency tables up to date. At the end of the call, frequencies are made available and can again be used by any pair of SPADE terminals. Thanks to efficient use of 400 satellite transmission lines to handle the traffic to as many as 3,000 accessible surface transmission lines, the SPADE system makes it possible to establish economical direct communications even on routes with low traffic, which improves the quality of service and is conducive to the development of traffic.

The basic configuration of the "Yugoslavia 1" ground station is shown in Figure 4.

The multichannel FDM signal which arrives by radio-relay links (RR) from the international office in Belgrade is prepared into FDM form envisaged for communication via satellite in the multiplex subsystem (MUX) of the ground station. The basic bandwidth thus shaped goes to the communication transmission subsystem (TxGCE), which is made up of a sizable number of narrow-band chains. In this subsystem the signal of the basic bandwidth is supplemented by a triangular signal for dispersion of energy and is led to the FM modulator, where the frequency modulation of the intermediate frequency of 70 MHz is done. After the FM modulator comes the MF filter and upward converter at whose output one obtains the RF signal at the desired frequency of about 6 GHz. For every transmission carrier there is a separate TxGCE chain. The transmission carriers are then added together and led to the subsystem of output power amplifiers (HBA), where they are amplified to the necessary level. The power amplifier subsystem consists of two broad-band amplifiers with 300-w TWT [traveling wave tube] tubes, which cover the entire satellite bandwidth of 500 MHz and which are used for telephone carriers, and one klystron amplifier with a power of 1 kw, which is used for television. The amplified carriers pass through the diplexer to the antenna which emits them toward the satellite.

In reception the high-gain antenna receives the weak signal at 4 GHz coming from the satellite. The broad-band low-noise amplifiers (LNA), which cover the entire satellite bandwidth of 500 MHz, amplify the complete incoming signal from the satellite, with minimal degradation of quality. In the communication reception subsystem (Rx-GCE) the carriers of correspondent ground stations are sorted out by narrow-band chains, converted to the intermediate frequency (79 MHz), demodulated in the FM demodulator, and after de-IF-ing and removal of the triangular signal for energy dispersion one gets the FDM signal in the basic bandwidth. In the multiplex subsystem (MUX) parts of the basic bandwidths from various ground stations intended for the "Yugoslavia 1" ground station are separated, and a unified basic bandwidth is formed for transmission by RR link to Belgrade.

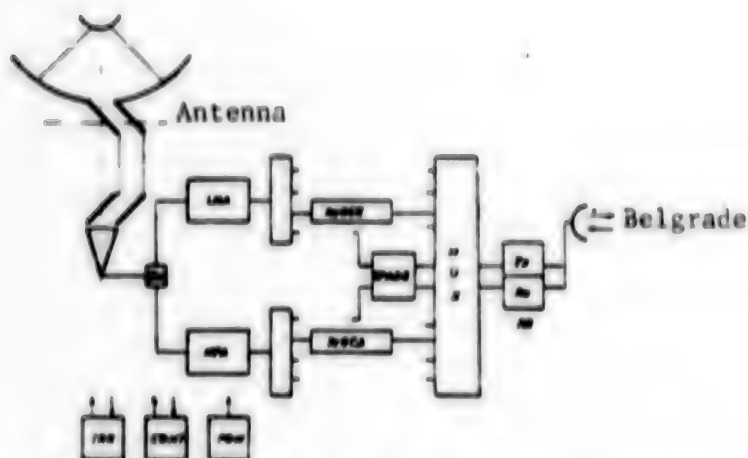


Figure 4. Configuration of the "Yugoslavia 1" ground station.

The SPADE equipment is linked to the Tx and Rx GCE subsystems at the intermediate frequency and to the multiplex subsystem at the level of telephone channels.

Aside from the subsystems we have mentioned, there are also subsystems in the ground station for automatic satellite tracking and antenna power (TRK), for control and supervision (CONT) and for reserve and continuous power feed of the equipment (POW).

A more detailed description of the configuration and operation of the equipment is given in the literature [5-8].

In order to increase the reliability, the vital pieces of equipment of the ground station, aside from the antenna, are duplicated. In this respect the station is attaining enviable results. It has always been above the average in the Intelsat system, and on several occasions it has been first because of no interruption in its operation whatsoever over 6-month observation periods. Results of this kind are the result of reliable equipment, quality maintenance and good selection of the station's configuration.

The quality of transmission of telephone and TV signals exceeds CCIR recommendations and Intelsat regulations [9-11]. During transmission from the 1976 Olympic Games in Montreal the "Yugoslavia" station was judged to be by far the best in Europe by European television organizations [12].

For the sake of adaptation for operation with satellites of the INTELSAT V generation, which will come into use in 1981, a modification was recently made successfully on the antenna of the "Yugoslavia" ground station to make the antenna capable of operation with dual polarization. Verification tests have been conducted and have confirmed that the station fulfills all the mandatory technical conditions of Intelsat for standard A stations for operation with INTELSAT V satellites.

The principal characteristics of the "Yugoslavia" ground station are given in Table 1.



Table 1. Technical Characteristics of the "Yugoslavia 1" Ground-Based Satellite Station

1. Frequency range used:
  - 5,925-6,425 MHz upward communication
  - 3,700-4,200 MHz downward communication
2. Quality factor of the station G/T:
  - 45 db/K with helium-cooled parameter amplifier
  - 41 db/K with thermoelectrically cooled amplifier
3. Antenna diameter: 32 meters
4. Antenna gain:
  - In transmission 64.9 db at 6.2 GHz
  - In reception 61.4 db at 4.0 GHz
5. Side emission beams: first transmission--18.9 db
6. Antenna movability: +170° at the azimuth 50° to 92° in elevation
7. Maximum satellite tracking speed: 0.1°/sec
8. Satellite tracking: automatic or manual
9. Noise temperature of parameter amplifiers:
  - Less than 20° K for the helium-cooled amplifier
  - About 80 K for the thermoelectrically cooled amplifier
10. Maximum power of output amplifiers:
  - 250 w for telphony
  - 800 w for television
11. Output power used:
  - About 40 w for telephony
  - About 250 w for television
12. The station is equipped for transmission of the following:
  - 2 telephone carriers each with a capacity of 60 telephone channels
  - 1 television video carrier
  - 1 television audio carrier
  - 12 SPADE carriers
13. The station is equipped for reception of the following:
  - 7 telephone carriers of variable capacities from 24 to 972 telephone channels
  - 1 television video carrier
  - 1 television audio carrier
  - 12 SPADE carriers

### 3.2. Trend of Telephone Traffic

Construction of the ground station was very important to the development of Yugoslavia's intercontinental traffic. The very fact of achieving 5 permanent direct routes and 15 direct links in the SPADE system: from the Middle and Near East, through Africa, Europe and North, Central and South America, speaks for itself.

It is interesting to see how telephone traffic has increased on certain routes in the Atlantic Ocean region. Figure 5 shows the trend of total telephone traffic in paid minutes between Yugoslavia and the United States and Canada, between 1968 and 1979. The same figure shows the growth index of traffic [13]. We note that the growth of traffic was exceptionally large in 1972 when the first satellite channels on these routes were established. Since that time the growth of traffic has stayed at a very high level to this very time, averaging 45 percent per year in traffic with the United States and about 42 percent per year in traffic with Canada. The growth of traffic in 1978 and 1979 resulted from introduction of semiautomatic traffic handling on these routes, and then also from the fact that some subscribers in the United States could dial a number in Yugoslavia automatically. The growth of traffic has been similar on other direct routes in the region of the Atlantic Ocean, though the absolute amount of the growth has been considerably smaller.

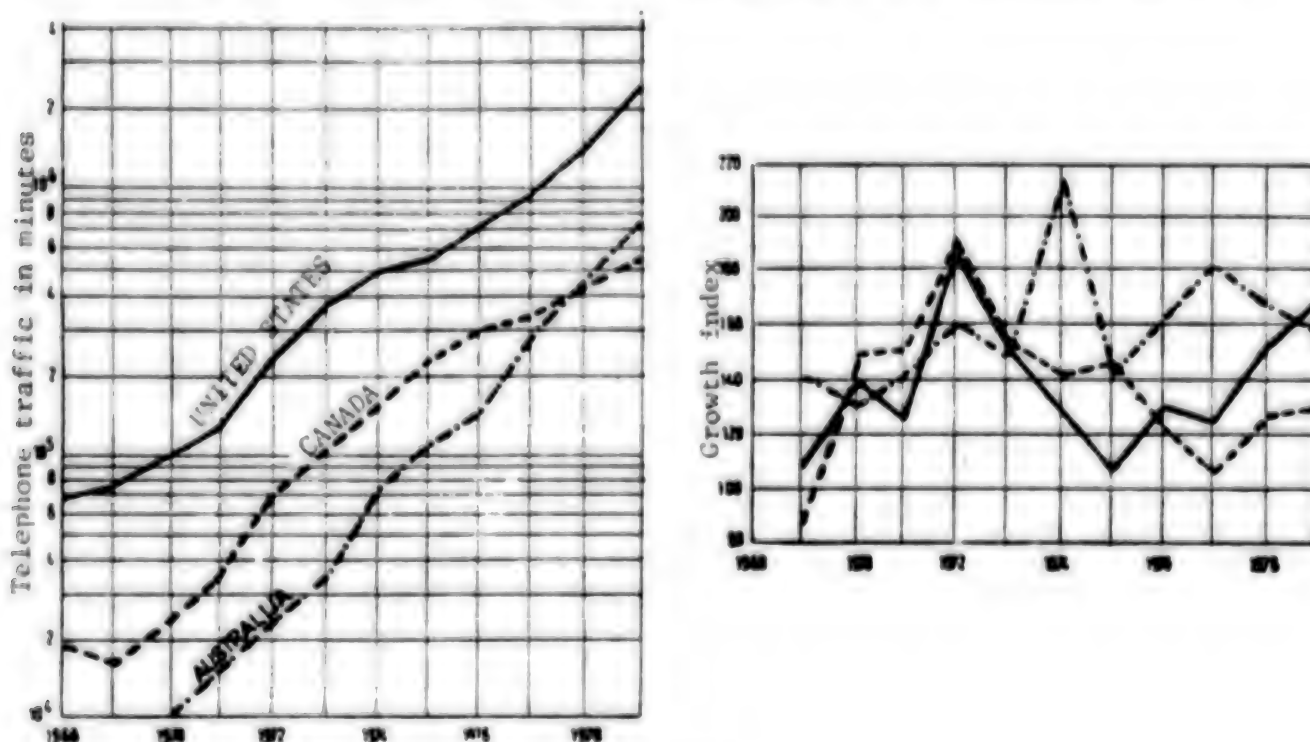


Figure 5.

Over the next few years we can anticipate in the Atlantic region of the Intelsat system a further considerable increase in traffic and establishment of new direct links as dictated by traffic. Introduction of automatic dialing by subscribers in Yugoslavia on intercontinental routes would give a considerable impetus to the further rapid growth of traffic and to raising services to a qualitatively higher level.



### 3.3. Future Development

Direct telephone-telegraph and TV communications with remote countries outside the Atlantic region can be achieved within the Intelsat system by means of satellites over the Indian Ocean. Because the needs have grown, the "Yugoslavia 2" ground station is about to be built for operation in the Indian Ocean region of the Intelsat system.

As we see from Figure 1, the Indian Ocean region covers Europe, Africa, the Near, Middle and Far East, and Australia. Within this region several routes are distinguished which are planned for handling through the "Yugoslavia 2" ground station after it is put into service, to Australia above all. The growth of total telephone traffic between Yugoslavia and Australia is also shown in Figure 5.

In view of the volume of that traffic least satellite channels through the ground station of a neighboring country have been used since 1974. We see in the figure that in that year telephone traffic more than doubled over the previous year. Over the entire period covered traffic between Yugoslavia and Australia has been growing at an exceptionally fast rate, especially since direct communications went into service in 1974. In this period the average annual growth of traffic has been 68 percent. If we compare this to the United States and Canada, we see that in 1979 traffic with Australia was 60 percent greater than traffic with the United States at the time when the "Yugoslavia 1" ground station was put into service (1974) and that it has already exceeded present traffic with Canada.

Returning to Figure 1, we see that thanks to simultaneous operation in the Atlantic Ocean region and the Indian Ocean region of the Intelsat system, practically the entire world will be covered. Only New Zealand and Oceania cannot be reached. Consequently, the "Yugoslavia 1" and "Yugoslavia 2" ground stations will make it possible to establish direct communications on any intercontinental route as necessary. This coverage is also extremely important for television.

The European PTT administrations of the members of CEPT have formed the international organization EUTELSAT, whose task is to administer the space segments of the satellite systems in Europe which are being established to meet the needs of the PTT administrations. The European communications satellite (ECS) will be used to assign a portion of the public telephone and telegraph traffic among the European correspondents. The share of traffic which will be sent via satellite will be established by bilateral agreement. It is expected that this will amount to approximately between one-fourth and one-third of the total traffic between two international centers.

By contrast with the situation on intercontinental routes, where the satellite is often the sole means of establishing direct communications, the ECS system is based on the need for the greatest possible diversification of the large beams that exist in the surface telecommunications network of Europe, which is already well developed. The satellite system was selected as one of the means of diversification, provided it is not more expensive than surface communications. For that reason only fairly long routes, when the distance between international centers is at least about 800 km, come into consideration for routing via satellite. It is more

economical for shorter distances to accomplish diversification by adding on surface systems for telephone and telegraph transmission.

Aside from diversification, the ECS satellite system will also afford greater flexibility in establishing communications in Europe.

The ground stations for the ECS system of most European countries which are members of EUTELSAT will be in operation in 1983.

It is estimated [14] that in 1985 Yugoslavia will be handling on European routes a total between 30 and 70 million minutes of telephone traffic via satellite. It is also estimated that handling that volume of traffic will require between 370 and 890 satellite transmission lines.

The planned construction of the Yugoslav ground station for operation within the ECS system by the end of 1984 will facilitate diversification and more economical routing of the telephone and telegraph traffic of Yugoslav PTT enterprises on some 15 European routes.

Should ECS be used for TV transmissions as well, Yugoslav Radio and Television will also be able to exchange programs with European and Mediterranean partners via satellite.

#### 4. Conclusion

With construction of the "Yugoslavia 1" ground station the Yugoslav PTT enterprises have become active participants in the Atlantic region of the Intelsat system. Since construction of the station transportation has increased many times over, and the number of direct intercontinental routes has passed 20.

Now that 7 years' experience have been gained, it can be said with confidence that satellite communications have fully justified expectations with respect to quality, reliability, flexibility and maintenance and have won the full confidence of the owners and users of telephone-telegraph and TV communications.

With construction of the "Yugoslavia 2" ground station for operation in the Indian Ocean region of the Intelsat system and of the ECS station for operation in the European satellite telecommunications system, the Yugoslav PTT enterprises will be able to establish direct intercontinental communications with the entire world and also achieve diversification and flexibility of telephone-telegraph transmissions within Europe. Yugoslav Radio and Television will be able to exchange TV programs directly with practically all countries in the world.

#### BIBLIOGRAPHY

1. Clarke, Arthur C., "The Space Station. Its Radio Application," 1945.
2. Bargellini, L. P., (editor), "The INTELSAT IV Communications System," COMSAT TECH. REV., Vol 2, Fall 1972.

3. Dicks, L. J., and Brown, P. M., Jr., "INTELSAT IV-A Satellite Transmission Design," COMSAT TECH. REV.
4. Stojkovic, M., and Sion, A., "INTELSAT IV-A Satellites of the Intelsat Global Telecommunications System," paper delivered at the Second International Symposium Devoted to the Topic "Use of the Results of Space Exploration," Belgrade, September 1975; published in the journal PREGLED RAKETNE TEHNIKE, No 3-4, 1975. ARS [expansion unknown] of Bosnia-Hercegovina, AARD [expansion unknown]--Sarajevo.
5. Nedeljkovic, S., "The 'Yugoslavia' Ground Station--Part of the Global Satellite Telecommunications System," TELEKOMUNIKACIJE, Vol 23, No 4, 1974.
6. Stojkovic, M., "The Telecommunications System of the 'Yugoslavia' Ground Station," VIII simpozijum Telekomunikacije 74 [Eighth Symposium on Telecommunications 74], Ljubljana, October 1974, collection of papers.
7. Sion, A., "The Antenna of the Ground Station and the Tracking System," TELEKOMUNIKACIJE, Vol 23, No 4, 1974.
8. Stojanovic, M., "Multiplexing Equipment of the Ground-Based Satellite Station," TELEKOMUNIKACIJE, Vol 23, No 4, 1974.
9. Stojkovic, M., "Quality of Traffic in Satellite Communications," TELEKOMUNIKACIJE, Vol 23, No 4, 1974.
10. Stojkovic, A., Stojkovic, M., and Sion, A., "Transmission of Television Signals via the 'Yugoslavia' Ground Station," IX simpozijum Telekomunikacije 75 [Ninth Symposium on Telecommunications 75], Ljubljana, October 1975, collection of papers.
11. Stojkovic, A., Stojkovic, M., and Sion, A., "Certain Parameters of the Transmission Path of the Television Signal in Satellite Communications," X simpozijum Telekomunikacije 76 [10th Symposium on Telecommunications 76], Ljubljana, October 1976, collection of papers.
12. "Report on Television Transmissions of the XXI Summer Olympic Games at Montreal 17 July," 2d.
13. Sion, A., and Stojkovic, M., "Satellite Telecommunications in Our Country--Prospects for Development," paper delivered at a professional meeting on telecommunications, ETAN, 10-11 June 1980, Belgrade.
14. Nedeljkovic, S., Stojkovic, M., and Sion, A., "ECS--European Satellite Telecommunications System," paper delivered at the symposium on telecommunications, YUTEL-78, Ljubljana, October 1978.

7045

CSO: 5500

## BRAZIL

### FIGUEIREDO APPROVES DOMESTIC COMMUNICATIONS SATELLITE

Rio de Janeiro GAZETA MERCANTIL in Portuguese 25 Feb 81 p 17

[Dispatch from Brasilia by Jose Roberto de Alencar]

[Text] Within 5 or 6 years the Brazilian Telecommunications Corporation (TELEBRAS) will have its own space satellite with about 12,000 channels for the domestic transmission of any type of signal: radio, TV, telephone, telex, data telecommunication, and whatever else there may be. Haroldo Correa de Mattos summoned the press yesterday morning to tell reporters that at his meeting with President Figueiredo the previous afternoon he had received authorization to continue the project the general guidelines of which had been designed by the Brazilian Space Activities Commission together with the Planning Secretariat of the Presidency of the Republic (SEPLAN).

After studying the matter a little longer and defining exactly what it wants, the ministry perhaps will call for international bids for construction of the satellite. That "perhaps" relates to the possibility of an intergovernment agreement, possibly more advantageous than international bids. Although the ministry is not looking for a partner among its South American neighbors, it does not discount that possibility. Argentina has already broached the subject.

In any case, alone or with partners, Brazil will not be able to use its satellite for international transmissions except with the (difficult) consent of INTELSAT. At the most, it will be able to lease channels for making domestic transmissions, but not from one country to another; which is not very important because, according to the minister, Brazil is a partner in INTELSAT and is its fourth or fifth biggest user and has no reason to hurt its business.

#### Cost

After the Brazilian satellite is ordered, it will take 4 or 5 years for delivery. During that period, national firms will be charged with installing the ground stations. When that was first contemplated in 1977, the whole project was estimated at about \$170 million. Today, with national companies handling ground installations, the expenditure of foreign capital should not exceed \$70 million, according to the minister.

The minister does not consider excessive the money devoted to the Brazilian Satellite Communications System (SBTC), as the as yet unnamed satellite is called. About 5 billion cruzeiros will be spent to install the ground stations and put the satellite in the sky, representing 4.3 percent of the TELEBRAS' budget authorized for this year. The minister said that the savings in leasing from INTELSAT alone (which has 20,000 channels) is enough to amortize that investment. After all, the builders of satellites (and there are many) usually give a 3-year lag plus 7 more years for amortization.

Although he has only two options to place the Brazilian satellite in orbit--NASA or Arian Space, a European enterprise headquartered in France--the minister does not envisage any major complications in ordering the rocket. The biggest problem seems to be time: the time spent for shipment of the order (which may delay the inauguration of the satellite until Figueiredo's successor and his minister), as well as the time that elapses before a satellite breaks up: it may last much longer but no one ever counts on a satellite lasting more than 10 years.

8711

CSO: 5500



## BRAZIL

### BRIEFS

**COMMUNICATIONS MINISTER VISITS EUROPE--Brasilia--**Communications Minister Haroldo de Mattos begins an 8-day visit to three European countries today to make contacts in the telecommunications area. Secretary General Romulo Villar Furtado will be acting minister during that period. Haroldo de Mattos will arrive in Paris tomorrow and on 9 March, after seeing Ambassador Nascimento e Silva and the French secretary of state for posts and telecommunications, Pierre Ribes, he will sign a complementary agreement for technical cooperation between the two governments in the areas of telecommunications, amateur radio and data processing. On Monday afternoon, Haroldo de Mattos is going to the city of Velizy to visit the Teletel Company to familiarize himself with the video text pilot experiment. The system is being installed experimentally in Sao Paulo and is already commercially operational in France. On the same day, the minister is going to Meudon to visit the Thomson Space Company, which specialized in building domestic satellites. On 10 March, the minister is going to Toulouse to visit the Matra Company, which builds the rocket used to launch the domestic satellite. The minister is going to Copenhagen, Denmark, to familiarize himself with the companies in the area of data communication. On 12 March, he will go to London to visit the BBC, where he will familiarize himself the operation of that firm and will analyze there the possibility of an exchange for the production of RADIOBRAS [Brazilian Radiobroadcasting Company] programs. [Rio de Janeiro O GLOBO in Portuguese 6 Mar 81 p 5] 8711

**COMMUNICATIONS MINISTER ON SATELLITE COST--Sao Paulo--**Communications Minister Haroldo Correa de Mattos said yesterday that he did not consider high the investment of \$70 million (5 billion cruzeiros) for the purchase of the domestic satellite the purchase plan of which was approved by President Joao Figueiredo the day before yesterday. According to the minister, the investment will not mean the reduction of funds for the land communication area. "In the first place, I do not consider the cost to be high because whenever we say that something is cheap or expensive we must establish a denominator. Our budget for this year for investment alone, approved by the Planning Secretariat (SEPLAN) for the Brazilian Telecommunications Corporation (TELEBRAS) group is 115 billion cruzeiros. Therefore, the 5 billion cruzeiros is not a very large fraction. Furthermore, those \$70 million will not be disbursed at one time. There will be a lag period and part of the amortization will be paid for with the revenue of the operation of the satellite itself, Haroldo de Mattos declared. Telephone



System: The new telephone system that will be inaugurated in the latter part of March by the VASP Airline was described by Minister Haroldo de Mattos as a "far-reaching measure." Passenger in flight will be able to telephone anywhere in the country. "VASP will transmit the plane's calls to ground receiving stations which will disseminate them through the TELEBRAS system," the minister said. [Rio de Janeiro O GLOBO in Portuguese 26 Feb 81 p 6] 8711

TECHNOLOGY TRANSFER CONTRACT CONTROLS--Brasilia--The Special Secretariat for Data Processing (SEI), henceforth, will control contracts for the transfer of technology--including in the area of methods and programs (software)--together with the National Industrial Property Institute (INPI). The INPI is the agency where all contracts of that type must be registered and approved. The SEI and the INPI have formed a joint committee that is going to meet periodically to study the contracts. Yesterday the secretary of data processing, Octavio Gennari Netto, and the president of the INPI, Arthur Carlos Bandeira, signed the charter which, in addition to formally forming the committee, establishes a system of mutual consultations between the two agencies to improve control over the transfer of technology in the data-processing area. The joint committee is going to study technology contracts in the area, including those that involve the importation of methods and programs and all contracts for providing services which involve the remittance of foreign exchange abroad. It was established, further, that the requests for patents pertaining to that sector forwarded to the INPI, will be sent to the SEI for technical evaluation before being approved or rejected. [Rio de Janeiro O GLOBO in Portuguese 13 Feb 81 p 15] 8711

DISCUSSIONS WITH VENEZUELA--Representatives of Brazil and Venezuela held a meeting in Caracas to exchange experiences in the field of telecommunications, with reference to the technical and human aspects, systems and development. Among the officials representing Brazil were the chief of the international telephone division of the Brazilian Telecommunications Company (EMBRATEL), Nelson Machado; the chief of the planning department of the Brazilian Telecommunications Corporation (TELEBRAS), Mario Bernardino Jubin; and the chief of the human resources division of TELEBRAS, Canuto Costa. [Rio de Janeiro O GLOBO in Portuguese 21 Feb 81 p 16] 8711

CSO: 5500

# MAGHREB MODERNIZES ITS COMMUNICATION SYSTEMS

London 8 DAYS in English 7 Mar 81 p 41

[Text]

THE MAGHREB, indeed the whole of Africa, is becoming the battleground for foreign firms eager to develop telecommunications networks. Out of the 450m telephones in the world only 5m are in Africa — and half of these are in South Africa alone. In the Sahel, telephones are particularly scarce. Installation costs are high and investment unprofitable, given the limited number of subscribers.

Efforts have been made since 1978 to develop transport and telecommunications throughout the African continent, and some progress has been achieved since a satellite telecommunication system was introduced, in French-speaking Africa.

But so far, it has generally been easier to make an international call than to dial a neighbouring country. Zaïre was the first country to use a satellite link for domestic calls, using Hertzian waves. Such installations are easier to carry out than cable installations in black Africa, but cable links are still preferred for urban networks.

Some \$14bn will probably be invested in the next decade to promote telecommunications development in black Africa alone. French companies like Thomson-CSF, CIT-Alcatel and CGE are already battling with firms from other countries for lucrative contracts.

American companies such as ITT are active in Nigeria and Algeria, while the Swedish group L. — whose French branch has just been absorbed by Thomson-CSF, has scored a major success in Tunisia: it has been awarded a contract to supply telephone exchanges in the north.

Nigeria, Algeria, Tunisia, Zaïre, Ivory

Coast and Senegal are the most interesting markets for telephone companies. With a population of 80m, Nigeria has only 100,000 telephone lines, a serious handicap for a country whose economic development has been spectacular in the past decade.

Algeria already has 300,000 lines for its 20m inhabitants, but it intends to install 1m new lines as soon as possible, and is spending some Algerian dinars 900m (\$233m) a year to install electronic telephone exchanges. The government has yet to decide on how to modernise its telephone networks, and foreign firms are closely watching all its moves.

Algeria's first step has been to approach the World Bank for a loan to cover a third of its investments in the next four years. Unlike most other African countries, Algeria has set up its own telephone industry, represented by two nationalised companies: Sonatie (Société Nationale de Travaux d'Infrastructures des Télécommunications), which organises the installation of telephone lines, and Sonelec (Société Nationale de Fabrication et de Montage de Matériel Electrique et Electronique) which manufactures Pentaconta and Metaconta telephone exchanges in its Telmeen plant.

Set up with help from the Spanish branch of ITT — Standard Electric SA — the Telmeen plant has a workforce of 2,000 and an annual production of 100,000 lines. The country also has a telephone cable plant in Qued Sma. France, despite its advanced technology in telecommunications and its strong links with Algeria, has had limited success in this country compared to

American or Japanese firms.

Morocco is not as well-equipped as Algeria, with only 150,000 telephone lines for its 20m inhabitants. But the country has increased the number of lines since 1972 by 50,000, and some important projects have been carried out. These include the installation of 19 telephone exchanges and three transit centres, plus the extension of 20 existing exchanges and five transit centres, as well as the laying of a submarine cable between Marseille and Tetouan.

However, the Moroccan government seems to have slowed down its efforts and the telephone network is now overloaded. Like Algeria, Morocco is trying to set up its own telephone industry, and already has a state company, Societe Nationale de Telecommunications (SNT). A second,

Somartel (Societe Marocaine du Telephone), jointly owned by the SNT and Thomson-CSF, was inaugurated a few months ago.

Tunisia, with 120,000 telephone lines for its 5m inhabitants, appears to have the edge over Algeria and Morocco, due to the fact that the government has made it a priority.

The main decision last year was to order 60,000 new lines from two European manufacturers: Sweden's Ericsson, which was awarded a \$32.6m contract to equip the north of Tunisia with new exchanges, and France's CIT-Alcatel which will equip southern cities like Sousse, Sfax and Gabes with its E10 temporal system. Tunisia is well-equipped with Hertzian wave systems and cables, and is expected to have a third submarine cable link with France and Europe next year.

CSO: 5500

**NIGERIA, IVORY COAST IN UNDERSEA CABLE VENTURE**

Lagos BUSINESS TIMES in English 3 Mar 81 p 1

[Article by Dapo Ajibola]

[Text] The marine cable laid jointly by the Nigerian Federal Government and the Ivory Coast Government is to be commissioned soon.

According to the Nigerian External Telecommunications Limited the cable laid by a French contractor SUBMARCOM as the main contractor and a subcontractor CITACCATEL, is already providing service to Dakar, Abidjan, Paris and West Germany.

Under the Third Development Plan the cable service was to have been laid to connect Nigeria with Europe through some West African countries. The part to be laid to Port Harcourt was envisaged during planned period but due to lack of money could not be accomplished.

The cost of the project, which was about N14 million was jointly borne by the two countries. Nigeria contributed N7.5 million and Ivory Coast about N6.5 million. The disparity in contribution is attributed to the fact that Ivory Coast had already had some infrastructure at Abidjan.

The 580 nautical miles has 480 voice circuits which run straight to Paris. From here it could be linked to cables from other parts of the world.

On the Southern wing of Nigeria, the cable is expected to be laid to Port Harcourt during this 4th National Development Plan period, from where it is hoped to be extended to Gabon and the Cameroons.

In the case of the extension to Cameroons the cost of extension will be borne by both countries, that is, Nigeria and Cameroons, as was the case of Ivory Coast and Nigeria.

Under the discussion is the prospect of extending cable services to the United States of America and the Republic of Benin. In the very near future too NET may be participating in the South American-Europe-African cable which is expected to cover the whole of South America.

CSO: 5500

SUBMARINE CABLE LINKS VARIOUS COUNTRIES

Kaduna NEW NIGERIAN in English 17 Mar 81 p 1

[Text]

**"Hello, hello. Is that Mr. President? Good afternoon", so said President Shahu Shagari yesterday to his Ivorian counterpart, President Felix Houphouet Boigny as the 17 million Naira submarine telephone cable linking Nigeria with other ECOWAS nations came into operation.**

President Shagari had been delivering his address at the commissioning ceremony of the international submarine cable prior to making the call when his Ivorian counterpart beat him to it at exactly 1.02 p.m. In the telephone conversation that followed which was applauded by Vice-President Alex Ekwueme, Governor Bola Ige of Oyo State, ministers and other dignitaries, both leaders congratulated each other on the realisation of the project.

During the conversation which was done through interpreters (Ivory Coast President speaking in French) President Shagari said "on the occasion of the official opening of Lagos to Abidjan submarine link, I heartily congratulate you and the entire people of Ivory Coast."

The president remarked: This is another step forward in the development of close ties in ECOWAS sub region of the great Continent of Africa.'

He then enjoined the Ivorian President to 'please extend warm greetings of the people of Nigeria to the entire populace of Ivory Coast'.

Replying, President Boigny said he was very happy to speak on the occasion.

He also pointed out that the new link would bring both countries together in the spirit of ECOWAS and OAU.

President Boigny implored President Shagari to extend 'warm and brotherly greetings to the people of Nigeria from their Ivorian brothers'.

Ending the conversation, President Shagari spoke in French saying "Merci beaucoup au-revoir" to the applause of all present.

The 17 million Naira submarine

cable is jointly owned by Nigerian External Telecommunications (NET), and Inceci of Ivory Coast.

The new system has five landing points in the sub-region at Dakar, Abidjan, Lagos, Doula and Pointe-Noire. For the international route it has landing points at Casablanca, Morocco and Penmarch, France.

## BRIEFS

SECOND SATELLITE ANTENNA--The minister for transport and communications, Mr Henry Kosgey, today opened the second antenna at the Longonot satellite earth station, on behalf of H. E. President Daniel Arap Moi. The second antenna has become necessary in view of a possible breakdown which would leave the whole of East African region in a state of telecommunications blackout. The Longonot station was originally built between 1969 and 1970, with one aerial pointing to the Indian Ocean satellite, at a cost of 30 million shillings. The new antenna will be linked to another satellite, over the Atlantic. [Excerpt] [LD271401 Nairobi Domestic Service in English 1800 GMT 26 Mar 81 EA]

CSO: 5500



## BRIEFS

FM RADIO STATION--A \$125,000 frequency modulation (FM) radio station, constructed by the Catholic Diocese in Monrovia, will officially be opened to the public on Saturday by the Head of State, Master Sergeant Samuel K. Doe. The station, to be called the "National Catholic Radio," will operate on 97.8 FM mega hertz (MHZ) from 6 p.m. to 10 p.m. daily. According to Rev. Patrick J. Harrington, Manager of the Station, the Station will feature educational, health, religious, news cast and all types of music on its daily programs beginning Saturday. The Vice Chairman of the Sacred Heart Parish Council, Christopher Minikon, said the dedicatory ceremony will commence at 3:30 p.m. on the court of Cathedral High School. [Fred Smith] [Text] [Monrovia NEW LIBERIAN in English 6 Mar 81 pp 1, 6]

CSO: 5500

## BRIEFS

**SOLAR MICROWAVE REPEATER**--The Postmaster General Mr Pieter Senekal, this week introduced pressmen to the newly-installed solar panel microwave repeater situated south-west of Windhoek. Mr Senekal, who was accompanied by the Deputy Director of Engineering Services, Mr Gerhard Ruck and retired Director of Posts and Telecommunications in Namibia, Mr John Francis, said the station is the biggest of its kind in Africa. He said equipment was obtained by tender from the Arco Solar company, California, in the United States through the South West Engineering (SWE) company. Messrs Helmut Finkeldey and Klaus-Eckart Borgwaldt were present on behalf of SWE. Explaining to pressmen the intricacies of the new solar system, Mr Ruck said equipment and installation costs amounted to about R30 000. He said the station, which became operative a week ago, can handle 240 calls simultaneously and can be expanded to 1 800 calls. He further explained that the new solar panel system, which utilises heat generated by the sun, is cheaper than electricity and will eventually result in much cheaper costs in the telecommunications services to the general public. The new solar system now replaces not only the usage of electricity and diesel-generated engines, but it is also used to charge batteries. It is further unique in that it needs servicing only once or twice per year in comparison to the old diesel system which had to be serviced up to two times per week. [Text] [Windhoek THE WINDHOEK ADVERTISER in English 20 Mar 81 p 18]

CSO: 5500

# SOME STATES ALLEGEDLY GOT TV FREQUENCIES ILLEGALLY

Kaduna NEW NIGERIAN in English 2 Mar 81 p 24

[Article by Onafune Amurun]

[Text] Minister of Communications, Mr. Isaac Shaahu, disclosed at the weekend that the allocation of television (TV) frequencies to some states was done illegally by some officials of the Post and Telecommunications (P&T) Department.

He made this known in Lagos at a meeting of Federal and state governments' representatives on TV frequency allocation.

Mr. Shaahu said while the constitution and laws of the country were clear on the issue, "few officers down the ladder in the P&T issued letters for which they did not have the authority and without any consultation with their superior officers."

The minister said in the process, grave errors were committed. He explained that existing allocations to other users, including the planned aerostat system, were not considered by those who made the allocations.

The minister also disclosed that "for the peace, order and good governance of the country," state television and broadcast coverage would be limited in range to state borders as far as possible.

Mr. Shaahu said this would ensure that one state did not use its facilities to destabilise others.

The minister told delegates that there would be enough frequencies for all, if these were carefully managed and planned. Frequency planning was a complicated business, he pointed out.

He said he would put forward recommendations for interim allocations to all state governments.

According to the minister, studies carried out by the ministry so far had stressed the need to move state television broadcasting from VHF to the UHF bands, for technical reasons.

The minister said it would be possible to allocate additional frequencies to state governments at the end of an on-going study to last about six months.

CSO: 5500

## BRIEFS

**ABUJA TELEPHONE EXCHANGE COMPLEX**--The new Federal Capital of Abuja is to have an ultra modern telephone exchange complex to ease the volume of calls in the existing exchange posts spread all over the country. The Chairman of the Nigerian External Telecommunication (NET), Dr. Ibrahim Tahir emphasised the importance of having an Exchange Complex at Abuja and told the minister that the second gateway telecommunication complex near Kaduna will also serve the ten northern states, adding that calls to and from outside the country meant for that part of the country could be sent and received through the complex independent of the Lagos NET complex. He said if there were many calls from different parts of the world which the NET complex in Lagos was unable to contain, others would automatically be transferred to the Kaduna International Exchange. The project at Kujama is being undertaken by an Irish firm--SISK Nigeria Limited at a cost of 12.5 million Naira, Dr. Ibrahim Tahir further disclosed. [Samaila Adamu] [Excerpts] [Kaduna NEW NIGERIAN in English 4 Mar 81 p 24]

**GOVERNOR: PERMIT SHORT WAVE**--The Kwara State Governor, Alhaji Adamu Atta, has called for the abrogation of the law which forbids state-owned radio stations from operating on the short wave frequency. He made the call in Ilorin in an address to the eighth meeting of chief executives of the federal and state radio organisations in the country. Alhaji Adamu Atta said that it was necessary for state radio stations to operate on such wave lengths in order that all Nigerians, irrespective of their places of abode, could freely tune any station of their choice. It was only through this step that the constitutional provision of ensuring the imparting of ideas and information without interference could be complied with, he argued. "A good government should allow a free flow of information because it is by so doing that it can have feedback on its policies and activities," he said. Governor Adamu Atta also implored the radio chief executives to offer constructive advice to their various governments on the controversy over the establishment of more radio and television stations by interested state governments. "As professional broadcasters, you will be failing in your duties by maintaining silence on the controversy," he further stated. (NAN). [Text] [Kaduna NEW NIGERIAN in English 10 Mar 81 p 7]

CSO: 5500

## MINISTRY REPORT TO FOLKETING URGES STATE CONTROL PHONE NET

Copenhagen BERLINGSKE TIDENDE in Danish 13 Feb 81 p 2

[Article: "Telephone Companies to Be Subordinated to State Telecommunications Council"]

[Text] The telephone companies will in the future be subordinated to a State telecommunications council. The new State control agency will not merely coordinate the companies' basic decisions. It can also make decisions without regard to whether there is agreement between the companies.

The scope of the introduction of a strong State control agency in place of the heretofore existing inspectorate appears in a report which Transport Minister Jens Risgaard Knudsen presented in Parliament yesterday.

Originally the government intended to combine all telephone companies into a State company. However, the minister drew back from this for practical reasons. If it were elected to create a State company it would be necessary to employ 7000 of the telephone companies' personnel as civil servants. If it were elected to create a State-owned corporation it would be necessary to transfer 2500 civil servants to the company. In addition, it would be necessary to buy up about 155 million kroner of shares. Finally the minister states that "real profits resulting from efficiency associated with uniting have not been documented."

Meanwhile, in the same breath, he states that the telephone licenses contain "the necessary basis for public control of the companies' operations which is desirable" in the decisive areas, such as systems, the raising of loans, tariff policy, profits, salaries and pensions, etc.

It is this control he then proposes be introduced with a State telecommunications council. He has won support for this from the telephone companies, personnel organizations and the LO [Danish Federation of Trade Unions].

8985

CSO: 5500



# TELECOMMUNICATIONS EXPORTS INCREASE, DESPITE SMALL INDUSTRY SIZE

Oslo AFTENPOSTEN in Norwegian 23 Feb 81 p 27

[Article by Morten Abel]

[Text] "Considering recent developments in the electronics industry, the Norwegian market is no longer big enough for Elektrisk Bureau to remain competitive. Based on the assumption we can hold our position on the Norwegian market, foreign competitors will knock us out in 2 to 5 years if we ourselves do not get involved in the development of this industry internationally," Brede Heier, director of Elektrisk Bureau (EB) told AFTENPOSTEN.

International expansion is a leading issue with EB's administrative director Kjell Kveim. EB has a solid technical base due to its heavy investment in technical developments. An equally heavy investment will now be made in the development of new markets--about 100 million kroner annually.

EB's production capacity in Singapore is the company's major effort abroad and, for the time being, there are no plans to develop more plants outside Norway. However, EB is now in the process of establishing an independent company in Mexico, which will sell radio equipment. The company will assemble systems based on deliveries from local manufacturers and, eventually, parts from Norway. The giant Swedish concern L.M. Ericsson, which owns 25 percent of EB (75 percent is in Norwegian hands), is one of the biggest telephone-equipment suppliers in Mexico and has its own factory there. Much of the equipment will probably be supplied by that factory.

"We do not wish to establish production abroad if we do not have to, but there is so much protectionism in this area in many countries that it often becomes necessary. Mexico requires that most of the equipment be supplied by domestic producers. For that matter, half of the countries in the world practice this policy in our area of production," said Heier.

Hence, the decision to establish production facilities in Mexico was not made for reasons of profitability. Mexico would be closed to EB without it. EB also supplies equipment to the oil industry--alarm systems, communications equipment and cables--and the company figures the establishment in Mexico will enhance its position with respect to deliveries to the Mexican oil industry.

According to Mexican rules, half of a company's ownership must be in local hands and this is where Nafinsa, a government financing company, comes into the picture. EB has also worked closely with Den Norske Creditbank (DnC) to get this project underway.

Elektrisk Bureau will also cooperate with DnC in Houston, where it will establish a sales and contact office, particularly in connection with the oil industry. The company will also test the American market as far as other products are concerned, such as communications and alarm-systems equipment.

EB has had several large contracts in Libya in the last few years, supplying equipment to power plants as well as the oil and communications industry. As many as 20 to 25 company representatives have been stationed in Libya in connection with these contracts. Contracts valued at 100 million kroner are now under negotiation and if EB succeeds in getting these contracts, it will establish a permanent office in Libya.

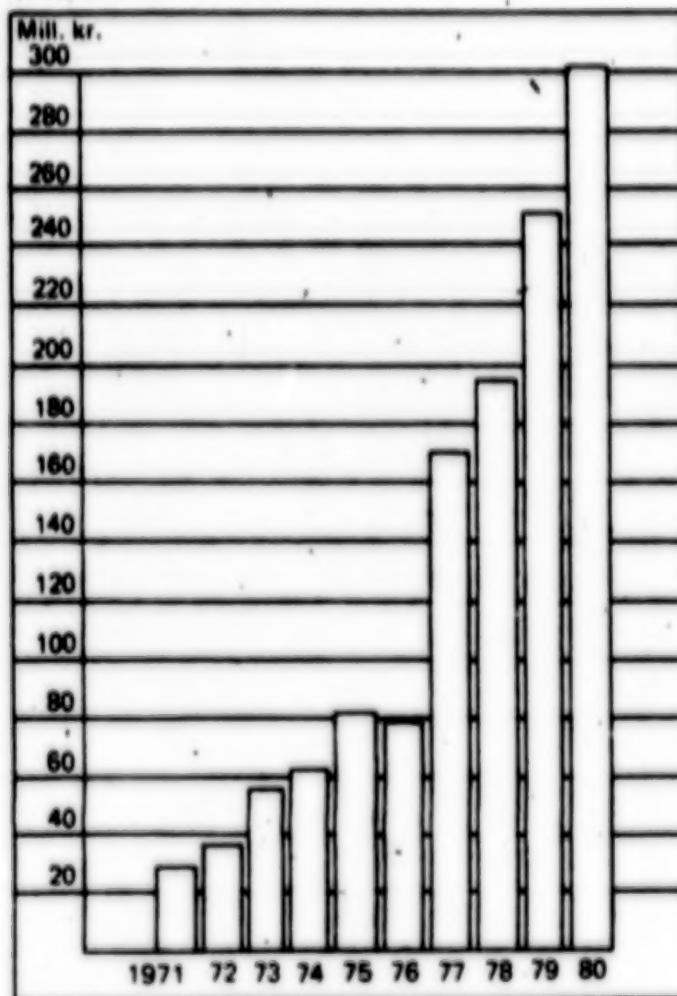
"We have people here who have had up to 2 years of training courses," said Heier. "Those who come here often have very little basic education--in some instances they do not understand English so that we must start with basic elementary education, both in language and mathematics, for example. We have good cooperation in this area from the NKI school. Actually, education is the best kind of foreign aid we could give," said Heier.

"Up to now, we have tried to spread ourselves throughout the world. That was the thing to do while in the process of getting established.

"Now we must try to limit ourselves and, besides Scandinavia, we have chosen six main areas--the Middle East, West Africa, North Africa, America, the ASEAN countries and England. We strongly emphasize local management in these areas--we will not attempt to run the business from here; it is not enough to visit a country four times a year. We will not get involved in license agreements either, but will rather establish direct customer contact. We want to be able to talk to the customer without having to go through a middleman so that we can become acquainted with his needs," said Heier.

Last year the value of EB sales abroad was approximately 315 million kroner, compared to total company sales of almost 1500 million. The yield on foreign sales was better than average for a Norwegian industry, but it is not enough. EB is trying to increase the yield on foreign sales so that capital can be built up in this sector as well. In the longer term, exports should constitute about 30 percent of all sales, according to EB management.

EB COMPANY SALES  
OUTSIDE NORWAY



Most Important Export Products

- Power Plant
- Communications
- Radio Stations
- Radio
- Mobile Communications Equipment
- Cables

8952

CSO: 5500

END

**END OF**

**FICHE**

**DATE FILMED**

4/17/81

---